

***Conservation Assessment
for the
Eastern Cave-Loving Funnel Web Spider (*Calymmaria cavicola*)***



USDA Forest Service, Eastern Region

October 2002

Julian J. Lewis, Ph.D.
J. Lewis & Associates
Biological Consulting
217 W. Carter Avenue
Clarksville, IN 47129
lewisbioconsult@aol.com



This Conservation Assessment compiles the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

Table of Contents

EXECUTIVE SUMMARY	4
NOMENCLATURE AND TAXONOMY.....	4
DESCRIPTION OF SPECIES.....	4
LIFE HISTORY	4
HABITAT	4
DISTRIBUTION AND ABUNDANCE.....	5
RANGEWIDE STATUS	5
POPULATION BIOLOGY AND VIABILITY.....	5
POTENTIAL THREATS.....	5
SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION.....	6
SUMMARY OF EXISTING MANAGEMENT ACTIVITIES.....	6
RESEARCH AND MONITORING	7
RECOMMENDATIONS.....	7
REFERENCES.....	7

EXECUTIVE SUMMARY

The Eastern cave-loving funnel web spider is designated as a Regional Forester Sensitive Species on the Hoosier National Forest in the Eastern Region of the US Forest Service. This species also occurs in the vicinity of the Monongahela National Forest and the Shawnee National Forest. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

Calymmaria cavicola is a troglomorphic spider that occurs across the southeastern United States. Although the range of the species is wide, it is sporadic in occurrence, and absent from many seemingly suitable caves. It is state imperiled (S2) in Indiana.

NOMENCLATURE AND TAXONOMY

Classification: Class Arachnida
Order Araneae
Family Agelenidae

Scientific name: Calymmaria cavicola

Common name: Eastern cave-loving funnel web spider

Synonyms: Tegenaria cavicola

This species was described as Tegenaria cavicola by Banks (1897).

DESCRIPTION OF SPECIES

This spider has a carapace, abdomen and legs that are yellowish orange. The abdomen has faint gray chevrons. The legs are elongate relative to other funnel-web spiders. Maximum size of the spider is about 6mm. Identification of this spider requires examination by a specialist familiar with spider systematics.

LIFE HISTORY

Although nothing is known specifically about the life history of Calymmaria cavicola, generally, funnel-web spider females lay eggs in the fall of the year and then die shortly thereafter, completing a life cycle of about one year (Gertsch, 1949).

HABITAT

This spider is a troglophile, indicating that it will live in caves as well as other similar habitats. Calymmaria cavicola is usually found associated with its web in a crevice in the entrance zone of caves. About the type-locality at Saltpeter Cave, Crawford County, Indiana, Banks (1897) reported that “This species was taken about 75 feet back from the entrance of the cave. It spins a handsome web, basket-like in form, attached to the roof”. Typically members of this family have sheet webs

with a tubular retreat into a crevice, where the spider remains until prey is detected in the web. Hunting occurs only within the silken field of the funnel-web. The spider emerges rapidly from the funnel to bite the prey, and after it has been weakened, drags it back into the funnel for feeding (Headstrom, 1973).

DISTRIBUTION AND ABUNDANCE

This species occurs from Maryland south to Florida, west to Alabama, west to Illinois (Headstrom, 1973; Peck and Lewis, 1978; Holsinger and Culver 1988). Holsinger and Culver (1988) summarized cave records from Alabama, Georgia, Illinois, Kentucky, Tennessee and West Virginia (the type-locality is in Indiana) and noted it to also occur in dark, wooded epigean habitats. Although it is widespread this spider seems to be sporadic in its occurrence and does not turn up in many seemingly suitable habitats (caves) within this range.

RANGEWIDE STATUS

Global Rank: G4 apparently secure; The global rank of G4 is usually assigned species that have been recorded from more than 100 localities. Although the published records of this species would place it within the G3 range, the cryptic nature of the species suggests a higher rank.

Indiana State Rank: S2 imperiled; The state rank of S2 is assigned to species that have been recorded from 6-20 localities. In Indiana Calymmaria cavicola is known from Saltpeter Cave (type-locality, Crawford Co., Banks, 1897), a pit in Harrison County, and three other caves in Crawford County (Lewis, 1998).

POPULATION BIOLOGY AND VIABILITY

Little is known specifically about Calymmaria cavicola, although it is a predator that seems to be well protected from other predators by its cryptic habitat. This species is viable throughout its range.

POTENTIAL THREATS

The primary threat to the caves inhabited by Calymmaria cavicola in the Hoosier National Forest is due to human visitation.

With the presence of humans in caves comes an increased risk of vandalism or littering of the habitat, disruption of habitat and trampling of fauna, introduction of microbial flora non-native to the cave or introduction of hazardous materials like spent carbide or batteries (Keith, 1988; Elliott, 1998, Peck, 1969).

Fire and smoke are potential sources of airborne particulate contamination and hazardous material introduction to the cave environment. Elliott (1998) reviewed the possible insecticide effects of cigarette smoke from cave visitors and the numerous harmful chemicals present in it (Feinstein, 1952; Howarth, 1983). Many caves have active air currents that serve to inhale surface air from one entrance and exhale it from another. Ashes in the entrance of several of the caves in the Mesmore area

attest to campfires being built there. This activity produces a dead zone due to the heat involved, alters the habitat as well as making smoke.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

On the Hoosier National Forest Calymmaria cavicola has been found at three sites (Mesmore Spring, Papoose and Little Indian caves) in the same immediate vicinity in the Hemlock Cliffs Special Area of Crawford County (Lewis, et al. 2002; and in progress). It is also known from Saltpeter Cave in Wyandotte Caves State Recreation Area, and Limekiln Hollow Pit in the Crawford Harrison State Forest.

SUMMARY OF EXISTING MANAGEMENT ACTIVITIES

There are no species specific activities concerning Calymmaria cavicola. Cave and karst habitat located on the Hoosier National Forest are, however, subject to standards and guidelines for caves and karst protection and management as outlined in the Hoosier National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service, 1991). These standards and guidelines include the following:

- *Caves are protected and managed in accordance with the Federal Cave and Karst Resources Protection Act of 1988, Forest Service Manual 2353, Memorandums of Understanding between the forest service and the National Speleological Society, the Indiana Karst Conservancy, Inc., the Forest Cave Management Implementation Plan, and individual specific cave management plans.

- *Except where modified by an existing cave management prescription, vegetation within a 150-200 foot radius of cave entrances and infeeder drainages with slopes greater than 30 percent will generally not be cut. No surface disturbing activities will be conducted on any slopes steeper than 30 percent adjacent to cave entrances. Similar protection areas will be maintained around direct drainage inputs such as sinkholes and swallow holes known to open into a cave's drainage system of any streams flowing into a known cave.

- *Allow no sediment from erosion of access roads and drilling sites to wash into caves or karst features.

- *Seismic surveys requiring explosives shall not be conducted directly over known cave passages or conduits.

- *All caves will be managed as significant.

(USDA Forest Service, 1991)

The forest plan includes a cave and karst management implementation plan. This management plan places an emphasis on cave resource protection and mitigation. Understanding of the caves is established through mapping, bioinventory, cataloging of resources (e.g., archaeological,

paleontological, speleothems, etc.), and estimating use levels and trends. Protection zones or other mitigation measures recommended by a management prescription will be established around caves entrances, sinkholes and swallowholes. Specific criteria will include consideration for protection of entrance and cave passage microclimate, animals inhabiting the cave, physical and chemical parameters and aesthetic values associated with the cave.

RESEARCH AND MONITORING

All records of this species are from a bioinventory of caves of the Hoosier National Forest (Lewis, et al., 2002; and in progress).

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

REFERENCES

- Banks, Nathan. 1897. Arachnida. Pages 202-205 in Blatchley, W.S. Indiana caves and their fauna. Twenty-first Annual Report of the Indiana Department of Geology and Natural Resources, 211 pages.
- Elliott, William R. 1998. Conservation of the North American cave and karst biota. Subterranean Biota (Ecosystems of the World). Elsevier Science. Electronic preprint at www.utexas.edu/depts/tnhc/.www/biospeleology/preprint.htm. 29 pages.
- Feinstein, L. 1952. Insecticides from plants. In Insects, The Yearbook of Agriculture. U.S. Department of Agriculture, 222-229.
- Gertsch, Willis J. 1949. American Spiders. D. Van Nostrand Co., Inc., New York, 285 pages.
- Headstrom, Richard. 1973. Spiders of the United States. A.S. Barnes and Company, Cranberry, New Jersey, 267 pages.
- Holsinger, John R. and David C. Culver. 1988. The invertebrate cave fauna of Virginia and a part of eastern Tennessee: Zoogeography and Ecology. *Brimleyana*, 14: 1-162.
- Howarth, F. G. 1983. The conservation of Hawaii's cave resources. *Newsletter of Cave Conservation and Management*, 2 (1-2): 19-23.
- Kaston, B.J. 1978. How to know the spiders. Third edition, William C. Brown Company Publishers, 272 pages.
- Keith, J.H. 1988. Distribution of Northern cavefish, *Amblyopsis spelaea* DeKay, in Indiana and Kentucky and recommendations for its protection. *Natural Areas Journal*, 8 (2): 69-79.

Lewis, Julian J. 1998. The subterranean fauna of the Blue River area. Final Report, The Nature Conservancy, 266 pages.

_____, Ronnie Burns and Salisa Rafail. 2002. The subterranean fauna of the Hoosier National Forest. Unpublished report, 115 pages.

Peck, Stewart B. 1969. Spent carbide – a poison to cave fauna. NSS Bulletin, 31(2): 53-54.

_____ and Julian J. Lewis. 1978. Zoogeography and evolution of the subterranean invertebrate faunas of Illinois and southeastern Missouri. N.S.S. Bulletin, 40 (2): 39-63.

USDA Forest Service. 1991. Land and Resource Management Plan Amendment for the Hoosier National Forest.

Prepared by

Julian J. Lewis, Ph.D.
J. Lewis & Associates, Biological Consulting
217 W. Carter Avenue
Clarksville, IN 47129
lewisbioconsult@aol.com

Reviewed by

Joseph A. Beatty, Ph.D.
Professor Emeritus
Southern Illinois University

Kelle Reynolds
Forest Wildlife Biologist/Karst Coordinator
Hoosier National Forest